

Rabies Policies and Procedures***(518) 474-3186******1-866-881-2809 (after hours)******SUBJECT: Guidance Regarding Human Rabies Exposure and Treatment Decisions*****I. Definition of Rabies Exposure**

A human exposure to rabies is defined as a bite or a scratch from a rabid or suspect-rabid animal or contamination of fresh wounds (i.e., have bled within the past 24 hours) or mucous membranes (eyes, nose, mouth, etc.) with infectious material (saliva, nervous tissue) from a rabid or suspect-rabid animal. According to the federal Rabies Prevention (1999) Recommendations of the Immunizations Practices Committee (ACIP), exposure is defined as a bite from a rabid animal or contamination of scratches, abrasions, open wounds or mucous membranes with saliva or other potentially infectious material (such as brain tissue) from a rabid animal. " **Other contact by itself, such as petting a rabid animal and contact with the blood, urine, or feces (e.g., guano) of a rabid animal, does not constitute an exposure and is not an indication for prophylaxis.**"

Because some bat bites may be less severe, and therefore more difficult to recognize, than bites inflicted by larger mammals, rabies postexposure treatment should be considered for any physical contact with bats, or when there is a reasonable probability of an exposure. Some examples include: a sleeping person awakens to find a bat in the room, and an adult witnesses a bat in the room with a previously unattended child or mentally disabled or intoxicated person. (See "NYSDOH Guidelines for Managing Bats and Risk of Rabies Transmission" when assessing possible bat exposures.)

All suspected human exposures to rabies must be reported to the county health authority immediately.

Mucous membrane exposure. Human rabies cases where the source of exposure was known have primarily resulted from the bite of a rabid animal. Non-bite, mucous membrane (i.e., contact with infectious material via the eye or mouth, or eating uncooked, infected tissue) rabies transmission is rare. Possible exceptions include four cases linked to aerosol exposure under unusual situations, and eight cases of rabies in corneal transplant recipients from donors that died of acute, undiagnosed illnesses. However, due to the theoretical risk of transmission, we would advise postexposure treatment for persons who **definitively** report a reasonable probability of contamination of mucous membranes (eyes, nose, mouth) with saliva (i.e., perceptible fluid), or other potentially infectious material, such as spinal cord or brain tissue, from a rabid or highly-suspect rabid animal.

Exposure from body fluids other than saliva or cerebrospinal fluid, such as blood, urine, feces (including bat guano), milk, or skunk spray. These fluids have not been shown to contain infectious concentrations of rabies virus. Therefore, exposure to these fluids generally does not warrant rabies postexposure treatment. Contact with blood which may be contaminated with saliva, nervous tissue, or cerebrospinal fluid, for example, during decapitation, or coming from a wound in the mouth of a rabid animal, may constitute an exposure. Contact the State Health Department's Zoonoses Program for discussion of specific cases if necessary (518-474-3186).

Secondary exposure or "contact-transfer" of rabies. **Secondary exposure scenarios (i.e., raccoon has contact with a dog or cat which then transports infectious material from the raccoon to the human) are hypothetical and very unlikely to transmit rabies.** These situations are unlikely to require rabies postexposure treatment unless there is a clear indication that central nervous tissue or copious amounts of saliva from a rabid animal were present on the dog, cat, or environmental surface and that the human contaminated an open wound (e.g., broken skin that bled within the past 24 hours) or mucous membrane with this material. If the material was dry, transmission is unlikely. Rabies virus does not survive for long on environmental surfaces except within the nervous tissue of a rabid animal that has not yet undergone putrefaction. Usually treatment is not indicated under these secondary exposure scenarios. Contact the State Health Department's Zoonoses Program for discussion of specific cases (518-474-3186).

II. Need for Postexposure Treatment based on Rabies Status of the Animal

If a person is exposed to rabies as defined above, human rabies postexposure treatment is recommended if the animal is found to be rabid or if rabies cannot be ruled out.

Laboratory testing. Laboratory testing of animals in NYS is available free of charge at the NYSDOH Wadsworth Center's Rabies Laboratory. The Rabies Laboratory's specimen submission guidelines list the types of animals that will be accepted for testing, based on species, exposure history, clinical signs, or geographic location. Detailed instructions for sample submission are also provided. The submission guidelines are available at the Rabies Laboratory web site: www.wadsworth.org/rabies, or by phone at 518-869-4527.

The Rabies Laboratory will test emergency specimens by prior arrangement on Saturday, Sunday or holidays if received by 11 am and the animal has bitten a human, is strongly suspected of rabies, and where treatment is being withheld pending test results. To arrange emergency testing, contact the State Health Department Rabies Laboratory at (518) 869-4527 or after hours at (518) 527-7369 or (518) 527-7370. **If an animal is available for testing and the county health authority has reason to believe that treatment can be delayed pending test results, the county (and state) is not liable for the expense of treatment if begun in advance of receiving the test result.**

Domestic animal exposure. For this section, a domestic animal is defined as a dog, cat, ferret, sheep, goat, cattle, horse or swine. Rabies status for domestic animals can be determined either by laboratory testing or confinement and observation. In most instances, **if a domestic animal that bites, or otherwise potentially exposes a person, is available for rabies testing or confinement and observation, postexposure treatment should not be initiated.**

Exceptions to this may be made on the basis of severity of exposure (such as a facial bite or multiple bites) and risk of rabies in the exposing animal (based upon species, behavior, clinical presentation, and circumstances) when prompt specimen delivery and examination cannot be arranged.

A domestic animal is considered highly-suspect for rabies if it is exhibiting abnormal behavior or clinical signs compatible with rabies or if its attack was unprovoked. If a domestic animal has clinical signs compatible with rabies and has exposed a human, it should **not** be confined and observed. It should be humanely euthanized immediately and submitted for rabies testing.

An attack may be unprovoked from a person's point of view when it is actually provoked from the animal's point of view, and thus all bites do not indicate rabid behavior. Human provoking behaviors can include taking food, surprising, moving suddenly, making loud noises, touching, making eye contact, running, biking, invading territory, approaching a mother animal with a litter, or getting near an old or ill/injured animal. If an exposure has occurred in these types of situations, rabies postexposure treatment should **not** be started before attempting to determine the rabies status of the animal. Thus, confinement and observation as described below may be appropriate in the event of a "provoked" attack, depending on the circumstances.

If a domestic animal has exposed a human and is clinically normal (by definition NOT exhibiting neurologic signs, abnormal behavior or signs of illness), it may be held and observed daily for signs of rabies for 10 days commencing from the day the exposure occurred. Postexposure treatment should **not** be initiated under these circumstances. **County payment of rabies treatment costs will not be available for exposures to clinically normal animals under confinement and observation. Please be sure to advise patients and physicians accordingly.**

If the animal dies or becomes clinically ill during the 10 day observation period, and the county health authority and consulting veterinarian find the presentation compatible with rabies, then the animal should be humanely euthanized and submitted for rabies testing immediately. Postexposure treatment of exposed persons should then be initiated if rabies is not ruled out.

Exposure from other species of animals. Human exposure from species other than the previously defined domestic species generally requires euthanasia and testing of the animal to determine rabies status and the necessity of human postexposure treatment. The Sanitary Code states that

" . . . any animal other than a dog, cat, or domestic livestock suspected of being rabid shall not be held for observation and shall be destroyed immediately . . . ". Exceptions should be made for clinically normal ferrets. Other exceptions should be discussed on a case-by-case basis with the State Health Department, e.g. if the animal is particularly valuable, or under

extenuating circumstances. A highly-suspect rabid animal consists of rabies vector species, such as bats, raccoons, foxes, and skunks, or other animals with abnormal behavior or clinical signs compatible with rabies.

The following are recommendations for use in interpreting and administering this part (Section 2.14(f)(2)) of the Sanitary Code:

- Euthanasia should be required for all rabies vector species.
- Euthanasia should be required in all circumstances for any animal suspected of being rabid as indicated by having clinical signs of rabies.
- Euthanasia of an animal which does not exhibit signs of rabies, should not be required unless the type of human exposure (e.g. bite, scratch, or mucous membrane) would necessitate rabies treatment if the animal tests positive for rabies.
- If euthanasia of an asymptomatic animal is required due to the type of human exposure, but all exposed persons voluntarily request treatment rather than euthanasia of the animal, the county health authority may choose to not euthanize the animal if all of the following apply:
 - all exposed persons requesting treatment rather than euthanasia are adults of sound mind
 - all exposed persons are fully informed of the risks and side effects of treatment
 - all exposed persons are informed that the Sanitary Code requires euthanasia of an animal suspected of being rabid
 - all exposed persons are informed that the county health authority and state health department's recommendation is for the persons to cooperate with having the animal tested rather than take treatment
 - all exposed persons are informed that in the opinion of the health authorities it is not good medical practice to undergo medical treatment when there are ways of determining whether medical treatment is necessary, such as testing an animal which has potentially exposed someone to rabies
 - all exposed persons sign a statement acknowledging that they have been informed about all of the above and that they will assume financial responsibility for the treatment

The county health authority may utilize other available information in determining whether an animal is "suspected of being rabid". Such information includes species, incidence of rabies in that species, where the animal was born, how it was raised and housed, whether it had ever been outdoors, whether it ever had actual or possible contact with a rabid or rabies-suspect animal, whether it had ever had wounds of undocumented origin, etc.

Small rodents such as mice, squirrels, chipmunks, and rabbits are rarely documented with rabies, probably because they do not survive an attack from a rabid animal that would expose them to rabies. Thus, in most cases, bites or other exposures from these animals do not need to result in testing the animal or human postexposure treatment. Exceptions should be considered for those small rodents that are showing clinical signs of rabies. In addition, small rodents maintained in cages outside (such as domestic rabbits) may become exposed to rabies without receiving sufficient wounds to kill them, and thus testing them and/or human postexposure treatment may be necessary.

III. Postexposure Treatment Administration

Rabies vaccine for postexposure treatments should always be administered intramuscularly in the deltoid region, except in the case of small children where the vaccine may be administered in the lateral aspect of the thigh. Human Rabies Immune Globulin (HRIG) should never be administered in the same syringe or at the same site as vaccine. As much as possible of the HRIG should be administered at the site of exposure, if feasible. The remainder should be administered intramuscularly at a site(s) distant from the site of vaccine administration.

Those who are immunosuppressed when receiving postexposure treatment, for example, due to disease or receiving immunosuppressive agents such as corticosteroids, should have their response to treatment assessed with a serum sample collected for antibody titers 14-28 days after finishing the postexposure treatment.

IV. Postexposure Treatment Schedule

Details for the rabies postexposure treatment schedule are provided in the 1999 ACIP statement.

There is little information on the efficacy of altered postexposure treatment schedules. The timing of the first three doses of vaccine plus Human Rabies Immune Globulin (HRIG) is critical. The schedule for these doses should be adhered to as closely as possible. However, a one day variation in the schedule is not likely to be clinically significant.

If a patient is off-schedule, his/her postexposure treatment schedule should be evaluated on a case-by-case basis. Some considerations are:

- Under no circumstances should the series be re-started nor should additional HRIG be administered.
- If the deviation from the original schedule is minor, e.g., 2-3 days off within the first 14 days, maintain the dates as per the original schedule, if possible, but under no circumstances give vaccine doses any closer than three days apart and always maintain the 14 day interval between the fourth and fifth dose.
- If the deviation is greater than the 2-3 days or not within the first 14 days, resume the series maintaining the recommended spacing between doses (e.g. 2 weeks between dose 4 and 5).
- Although HRIG should be given on day 0 with the first dose of vaccine, it can be given up to 7 days after commencement of the vaccine schedule.
- If there is concern about significant deviation from the schedule, antibody titers should be verified on a serum sample collected 14-28 days after last vaccination.

No precise information is available regarding how quickly rabies postexposure treatment must begin after exposure in order to be effective. Once rabies symptoms have begun, treatment will not be successful. The rabies incubation period averages 2-3 months, but has been documented to vary in humans from 10 days to 6 years. As indicated previously, rabies treatment should be authorized and provided as soon as possible after a bite from a known or

highly suspect rabid animal, unless the animal's rabies status can be determined with laboratory testing or confinement and observation in a timely manner.

In the United States, postexposure treatments provided within 10 days of exposures have been completely effective. Thus, in most circumstances, adverse health consequences should not occur if rabies treatment is postponed pending determination of the rabies status of the animal.

If a bite from a known or highly suspect rabid animal is reported later than 10 days after exposure, even years after exposure, postexposure treatment should be recommended and authorized by county health authorities. Regardless of the length of time after exposure, if treatment is begun, HRIG also must be provided for those not previously vaccinated (see Part VII). For other possible **non-bite** exposures (e.g., a bat in someone's bedroom or handling a wild or domestic animal), it is usually not reasonable to recommend or authorize postexposure treatment for exposures that occurred longer ago than the average incubation period for rabies of 2-3 months.

V. Discontinuation of Postexposure Treatment

If rabies postexposure treatment is begun in emergency circumstances, it should be discontinued if the animal's rabies status is determined to be negative later in the treatment period. County health authorities should advise those receiving partial rabies postexposure treatments to consider requesting an antibody titer on a sample that is drawn 14-28 days after the last vaccination and at least 14 days after HRIG administration, in order to avoid the need for HRIG and extra doses of vaccine in the event of subsequent exposure treatments.

VI. Postexposure Treatment for Those Previously Vaccinated

Rabies postexposure treatment for those previously vaccinated only requires two doses of rabies vaccine, and no HRIG. According to the 1999 ACIP statement, previously vaccinated refers to "any person with a history of preexposure vaccination with HDCV, RVA, or PCEC; prior postexposure prophylaxis with HDCV, RVA, or PCEC; or previous vaccination with any other type of rabies vaccine and a documented history of antibody response to the prior vaccination." HDCV= human diploid cell vaccine, RVA= rabies vaccine adsorbed, and PCEC= purified chick embryo cell vaccine. This definition applies only to "persons who have previously received complete vaccination", referring to receiving all of the doses of vaccine and/or immune globulin according to the recommended schedule.

To avoid vaccine reactions (see Part VIII) those with prior rabies vaccinations that do not meet ACIP's definition of "previously vaccinated" may also wish to consider using only two doses of vaccine for subsequent postexposure treatments. This may include someone with a prior discontinued postexposure treatment or someone with a prior complete but altered schedule of postexposure treatment. This should only be considered for those who have a documented history of an antibody titer of 0.5 International Units on a sample that is drawn 14-28 days after the last vaccination and at least 14 days after HRIG administration. If no history of antibody response is available, the full postexposure treatment regimen including HRIG is recommended, even if HRIG has been previously administered in the person's lifetime. Specific situations may be discussed with the Zoonoses Program at 518-474-3186.

VII. Pre-exposure Vaccinations

Under Public Health Law, pre-exposure prophylaxis is not the responsibility of the county health authorities. However, county health authorities are encouraged to make pre-exposure vaccine available at cost to persons in high-risk occupations. This may help avoid unnecessary full postexposure treatments for persons in high-risk occupations, and conserve the limited supply of HRIG.

Pre-exposure prophylaxis may be administered either intradermally (0.1 ml) or intramuscularly (1.0 ml). Not all vaccine manufacturers are licensed for both types of products. Intradermal administration offers considerable cost savings. Intramuscular administration should be used for rabies laboratory workers, those who have frequent contact with the saliva of rabies vector species (raccoons, bats, skunks, foxes), those taking antimalarial prophylaxis at the same time as rabies pre-exposure vaccination, or those who are immunosuppressed due to disease or medical treatment. See the 1999 Rabies ACIP statement for more details.

Routine rabies boosters are not recommended for those previously immunized. Instead, rabies antibody titers should be checked every two years, and boosters administered only when the titer falls below 0.5 International Units. Antibody titers for this purpose are available free of charge through the NYSDOH Wadsworth Center Rabies Laboratory. Review specimen submission guidelines on their website: www.wadsworth.org/rabies, or call 518-869-4527 for instructions. Those with considerable rabies exposures (such as rabies laboratory workers) should have their titers checked every 6 months.

VIII. Adverse Reactions to Rabies Treatment

Treatment with rabies vaccine and rabies immune globulin is not completely risk-free. As with any biological, adverse reactions may occur following the administration of currently available approved human rabies vaccines or human rabies immune globulin, although no life threatening reactions have been reported to date. Thus, decisions on the necessity for rabies postexposure treatment in non-bite exposures should include consideration of the risk of treatment. See the 1999 ACIP statement for more details on the reactions which can occur and recommendations for their management. Reactions are more likely in those receiving pre-exposure boosters than in those receiving postexposure treatment.

Depending on the type of treatment reactions, switching to another manufacturer's rabies vaccine may reduce them for future immunizations. Immunosuppressive therapy such as corticosteroids should never be used to treat rabies vaccination reactions, because it may reduce the success of the rabies postexposure treatment! If corticosteroids are inadvertently used, a serum sample for rabies antibody testing should be submitted 14-28 days after the final treatment dosage to verify response to the postexposure treatment.

Any adverse events related to rabies treatment should be reported on the NYSDOH Rabies Report form (DOH-485) and should also be reported on a VAERS-1 form provided by CDC/FDA. VAERS forms should be mailed to the VAERS Coordinator, Room 649, Corning Tower, ESP, Albany, NY 12237-0627.